Curriculum Vitae

Mark A. Brewer

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Overview

My technical career, which now extends to half a decade, has included operation, maintenance and optimization of lidar instruments. The preparation and launch of multiple types of balloon-borne radiosondes, ECC ozone sondes, and Cryogenic Frost Point Hygrometers (CFH), and Lidar's System Administrator. I am currently a NASA certified small Unmanned Aircraft System (sUAS) safety Pilot in Command (PIC). I also have interim responsibility for networking operation and security at Table Mountain Facility (TMF) that communicates with IT lead and science customers about network connectivity. I'm excellent at troubleshooting and problem identification. I can evaluate situations and determines repair needs as well as provide innovative problem solving solutions to instrument and facility issues. I am responsible for incoming training of personnel on lidar operations, sonde flights, and preventative maintenance. My responsibilities as a technician of lidar operations require skill, care and safety such that failures can result in injury or loss of equipment and data that would adversely affect ongoing earth observation programs. I currently have an Associate of Sciences in Math and Science with 5 years of related experience. I participates on lidar and near-earth object (NEO) teams within 329 and 326. I've devised (with AutoCAD), fabricated, assembled and installed a bidirectional control circuit that operators a telescope shutter that complies with engineering and research specifications, and builds ozone and aerosol channels for lidar.

Operation, maintenance, and optimization of lidar instruments

In 2013 I joined Laboratory Studies and Atmospheric Observations (329H) group. During my time with lidar I operated, maintained, and optimized our systems. Five days a week (excluding holidays) I regularly operate the lidar systems after the end of astronomical twilight. I provide routine maintenance for the cooling system, flashlamps, harmonic generators, dichroic optics, lenses, and two Raman cells (cells of Hydrogen and Deuterium). This maintenance assures observations are optimal for continuous long-term measurements.

Preparation and launch of balloon-borne systems

Balloon-borne flights of PTU radiosondes are launched five times per month during new moon. My skills allow me to prepare 600 gram latex balloon filled with non-research grade helium. Each radiosonde launch consist of filling the balloon with helium so the flight rises at approximately seven meters per second. The ascent rate is used for optimal resolution up to approximately 33 kilometers in altitude. A few times per year that payload is equipped with a radiosonde, ECC ozone sonde, and a Cryogenic Frost Point Hygrometer. The skills I have help me prepare a 1200 gram balloon with the same similar helium as the above radiosonde launches. An additional weight is added to the prefill process for

continuous ascent rates of seven meters per second. The bursting altitude is again approximately 33 kilometers.

NASA certified sUAS safety Pilot in Command

In 2018 I was certified as a safety Pilot in Command by NASA Armstrong Flight and Research Facility. As a Pilot in Command I am directly responsible for and am the final authority as to the operation of the sUAS. I ensure that the small unmanned aircraft poses no undue hazard to people, aircraft, or other property in the event of losing control of the aircraft. I comply with applicable regulations and have the ability to direct the sUAS to ensure compliance.

Projects

Network for the Detection of Atmospheric Composition Change (NDACC)
The international Network for the Detection of Atmospheric Composition Change (NDACC) is composed of more than 70 high-quality, remote-sensing research stations.

Tropospheric Ozone Lidar Network (TOLNet)
The primary scientific objective is to provide time/height ozone measurements from near the surface to the top of the troposphere to describe in high-fidelity their spatio-temporal distribution.

Professional Experience

Jet Propulsion Laboratory, Research Technician II, Science Division, (2013 – Present)

Los Angeles City College, Internship, Jet Propulsion Laboratory, Asteroids, Comets, and Satellites Group, (2012 – 2013)

Columbus Technologies and Services, Internship, Jet Propulsion Laboratory, Optical Communications Telescope Laboratory, (2012 – 2012)

Education

AS Math and Science, Victor Valley College, Victorville, CA, 2013.

BS Applied Physics, California State University, San Bernardino, San Bernardino, CA, 2016 – Present.

Community Service

Community leader in university astronomy team with publication (six as first author) in SAO/NASA ADS and Jet Propulsion Laboratory/Table Mountain Facility team partnered with Kaiser Thrive Across America.

Scientific Publications

1. Thierry Leblanc, **Mark A. Brewer**, Patrick S. Wang, et al. (2018). Validation of the TOLNet Lidars: The Southern California Ozone Observation Project (SCOOP). *Atmospheric Measurement Techniques, 240.*
2. Hicks, M., **M. Brewer**, A. Carcione, S. Ebelhar, and R. Borlase. "Broadband Photometry of 11284 Belenus: A Large Low Delta-V Near-Earth Asteroid." SAO/NASA ADS. The Astronomer's Telegram, #4969, 1 Apr. 2013.
3. Hicks, M., **M. Brewer**, and J. Somers. "Broadband Photometry of 214869 (2007 PA8): A Slowly Rotating Potentially Hazardous Asteroid." SAO/NASA ADS. The Astronomer's Telegram, #4625, 1 Dec. 2012.
4. Hicks, M., D. Dombroski, and **M. Brewer**. "Broadband Photometry 330825 (2008 XE3): A Potential Binary Near-Earth Asteroid." SAO/NASA ADS. The Astronomer's Telegram, #4591, 1 Nov. 2012.
5. Hicks, M., **M. Brewer**, and J. Somers. "Broadband Photometry of the Near-Earth Asteroid 136993 (1998 ST49)." SAO/NASA ADS. The Astronomer's Telegram, #4588, 1 Nov. 2012.